

November 8, 2012

Brian Wootton, Hydrogeologist
Solid Waste Section
Division of Waste Management
1646 Mail Service Center
Raleigh, NC 27699-1646




RE: Installation of Landfill Gas Monitoring Probes
Germantown Landfill Permit No. #97-01
Wilkes County, North Carolina
JOYCE Project No. 00356.1201.11 Task 01

Dear Mr. Lane:

On behalf of Wilkes County, Joyce Engineering Inc. (JOYCE), is submitting the enclosed boring logs and driller's records for three landfill gas monitoring probes, installed on October 9, 2012 at the Germantown Landfill. The three probes (GP-1, GP-2 and GP-4) were installed along the northern border of the landfill property and were advanced to depths of 24 feet, 7 feet and 34 feet, respectively. Screen depth ranged from four feet below grade to the bottom of the boring in probes GP-1 and GP-4. In probe GP-2, the screen extended from 2 to 7 feet. Proposed probe GP-3 was not installed because groundwater was encountered at a depth of approximately five feet, prohibiting the installation of an effective gas monitoring probe. Probes were constructed of 1-inch PVC. Boring logs and probe completion diagrams, driller well construction records, and a site map showing probe locations are attached.

Please feel free to contact me at (336) 323-0092 if you have any questions regarding this submittal.

Sincerely,
JOYCE ENGINEERING

Larry Hineline
Technical Consultant

Attachments: Boring Logs
Drillers Well Construction Logs
Germantown Landfill Site Map

Cc: Kent Brandon, Wilkes County



Non RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2581

1. WELL CONTRACTOR:

BRIAN THOMAS

Well Contractor (Individual) Name

GEOLOGIC EXPLORATION, INC

Well Contractor Company Name

176 COMMERCE BLVD

Street Address

STATESVILLE

NC

28625

City or Town

State

Zip Code

(704) 872-7686

Area code Phone number

2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT#

OTHER ASSOCIATED PERMIT#(if applicable)

SITE WELL ID #(if applicable) GP-1

3. WELL USE (Check One Box) Monitoring ☐ Municipal/Public ☐

Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐

Irrigation ☐ Other ☒ (list use) GAS PROBE

DATE DRILLED 10/08/12

4. WELL LOCATION:

580 POPLAR GROVE ROAD 28697

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

CITY: WILKESBORO COUNTY: WILKES

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

☐ Slope ☐ Valley ☒ Flat ☐ Ridge ☐ Other

LATITUDE 36 ° 7 ' 8.1300 " DMS OR DD

LONGITUDE 81 ° 11 ' 56.8800 " DMS OR DD

Latitude/longitude source: ☒ GPS ☐ Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

5. FACILITY (Name of the business where the well is located.)

GERMANTOWN LANDFILL

N/A

Facility Name

Facility ID# (if applicable)

580 POPLAR GROVE ROAD

Street Address

WILKESBORO

NC

28697

City or Town

State

Zip Code

WILKES COUNTY SOLID WASTE SERVICES

Contact Name

PO BOX 389

Mailing Address

ROARING RIVER

NC

28669

City or Town

State

Zip Code

()

Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 22.0 FEET

b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒

c. WATER LEVEL Below Top of Casing: DRY FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.5 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): N/A METHOD OF TEST N/A

f. DISINFECTION: Type N/A Amount N/A

g. WATER ZONES (depth):

Top Bottom Top Bottom

Top Bottom Top Bottom

Top Bottom Top Bottom

7. CASING: Depth Diameter Thickness/Weight Material

Top 0.0 Bottom 4.0 Ft. 1 INCH SCH 40 PVC

Top Bottom Ft. in. in.

Top Bottom Ft. in. in.

8. GROUT: Depth Material Method

Top 0.0 Bottom 2.0 Ft. PORTLAND BENTONITE SLURRY

Top Bottom Ft. in. in.

Top Bottom Ft. in. in.

9. SCREEN: Depth Diameter Slot Size Material

Top 4.0 Bottom 22.0 Ft. 1.0 in. .010 in. PVC

Top Bottom Ft. in. in.

Top Bottom Ft. in. in.

10. SAND/GRAVEL PACK:

Depth Size Material

Top 3.0 Bottom 22.0 Ft. 20-40 FINE SILICA SAND

Top Bottom Ft. in. in.

Top Bottom Ft. in. in.

11. DRILLING LOG

Top Bottom Formation Description

0.0 / 8.0 BROWN SILTY CLAY

8.0 / 22.0 TAN SILTY CLAY

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12. REMARKS:

BENTONITE SEAL FROM 2.0 TO 3.0 FEET

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH

15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS

RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Brian Thomas 10/26/12

SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

BRIAN THOMAS

PRINTED NAME OF PERSON CONSTRUCTING THE WELL

Submit within 30 days of completion to: Division of Water Quality - Information Processing,
1617 Mail Service Center, Raleigh, NC 27699-1617, Phone : (919) 807-6300

Form GW-1b
Rev. 2/09



Non RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2581

1. WELL CONTRACTOR:

BRIAN THOMAS
Well Contractor (Individual) Name
GEOLOGIC EXPLORATION, INC
Well Contractor Company Name
176 COMMERCE BLVD
Street Address
STATESVILLE NC 28625
City or Town State Zip Code
(704) 872-7686
Area code Phone number

2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT#
OTHER ASSOCIATED PERMIT#(if applicable)
SITE WELL ID # (if applicable) GP-2

3. WELL USE (Check One Box) Monitoring ☐ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☒ (list use) GAS PROBE
DATE DRILLED 10/08/12

4. WELL LOCATION:

580 POPLAR GROVE ROAD 28697
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
CITY: WILKESBORO COUNTY: WILKES
TOPOGRAPHIC / LAND SETTING: (check appropriate box)
☐ Slope ☐ Valley ☒ Flat ☐ Ridge ☐ Other
LATITUDE 36 ° 7 ' 8.1300 " DMS OR DD
LONGITUDE 81 ° 11 ' 56.8800 " DMS OR DD
Latitude/longitude source: ☒ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

5. FACILITY (Name of the business where the well is located.)

GERMANTOWN LANDFILL N/A
Facility Name Facility ID# (if applicable)
580 POPLAR GROVE ROAD
Street Address
WILKESBORO NC 28697
City or Town State Zip Code
WILKES COUNTY SOLID WASTE SERVICES
Contact Name
PO BOX 389
Mailing Address
ROARING RIVER NC 28669
City or Town State Zip Code

()
Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 7.0 FEET
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: DRY FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): N/A METHOD OF TEST N/A
f. DISINFECTION: Type N/A Amount N/A

g. WATER ZONES (depth):
Top Bottom Top Bottom
Top Bottom Top Bottom
Top Bottom Top Bottom

7. CASING: Depth	Diameter	Thickness/Weight	Material
Top 0.0 Bottom 2.0 Ft. 1 INCH		SCH 40	PVC
Top Bottom Ft.			
Top Bottom Ft.			

8. GROUT: Depth	Material	Method
Top 0.0 Bottom 1.0 Ft. PORTLAND BENTONITE		SLURRY
Top Bottom Ft.		
Top Bottom Ft.		

9. SCREEN: Depth	Diameter	Slot Size	Material
Top 2.0 Bottom 7.0 Ft. 1.0 in. .010 in.			PVC
Top Bottom Ft. in. in.			
Top Bottom Ft. in. in.			

10. SAND/GRAVEL PACK: Depth	Size	Material
Top 1.5 Bottom 7.0 Ft. 20-40		FINE SILICA SAND
Top Bottom Ft.		
Top Bottom Ft.		

11. DRILLING LOG	Formation Description
Top Bottom	
0.0 / 7.0	TAN SILTY CLAY
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12. REMARKS:
BENTONITE SEAL FROM 1.0 TO 1.5 FEET

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 10/26/12
DATE

BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



Non RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2581

1. WELL CONTRACTOR:

BRIAN THOMAS
Well Contractor (Individual) Name
GEOLOGIC EXPLORATION, INC
Well Contractor Company Name
176 COMMERCE BLVD
Street Address
STATESVILLE NC 28625
City or Town State Zip Code
(704) 872-7686
Area code Phone number

2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT#
OTHER ASSOCIATED PERMIT#(if applicable)
SITE WELL ID #(if applicable) GP-4

3. WELL USE (Check One Box) Monitoring ☐ Municipal/Public ☐
Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐
Irrigation ☐ Other ☒ (list use) GAS PROBE
DATE DRILLED 10/08/12

4. WELL LOCATION:

580 POPLAR GROVE ROAD 28697
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
CITY: WILKESBORO COUNTY: WILKES
TOPOGRAPHIC / LAND SETTING: (check appropriate box)
☐ Slope ☐ Valley ☒ Flat ☐ Ridge ☐ Other
LATITUDE 36 ° 7 ' 8.1300 " DMS OR DD
LONGITUDE 81 ° 11 ' 56.8800 " DMS OR DD
Latitude/longitude source: ☒ GPS ☐ Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

5. FACILITY (Name of the business where the well is located.)

GERMANTOWN LANDFILL N/A
Facility Name Facility ID# (if applicable)
580 POPLAR GROVE ROAD
Street Address
WILKESBORO NC 28697
City or Town State Zip Code
WILKES COUNTY SOLID WASTE SERVICES
Contact Name
PO BOX 389
Mailing Address
ROARING RIVER NC 28669
City or Town State Zip Code

()
Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 34.0 FEET
b. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
c. WATER LEVEL Below Top of Casing: DRY FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): N/A METHOD OF TEST N/A
f. DISINFECTION: Type N/A Amount N/A
g. WATER ZONES (depth):
Top Bottom Top Bottom
Top Bottom Top Bottom
Top Bottom Top Bottom

7. CASING: Depth	Diameter	Thickness/Weight	Material
Top 0.0 Bottom 4.0 Ft.	1 INCH	SCH 40	PVC
Top Bottom Ft.			
Top Bottom Ft.			

8. GROUT: Depth	Material	Method
Top 0.0 Bottom 2.0 Ft.	PORTLAND BENTONITE	SLURRY
Top Bottom Ft.		
Top Bottom Ft.		

9. SCREEN: Depth	Diameter	Slot Size	Material
Top 4.0 Bottom 34.0 Ft.	1.0 in.	.010 in.	PVC
Top Bottom Ft.			
Top Bottom Ft.			

10. SAND/GRAVEL PACK: Depth	Size	Material
Top 3.0 Bottom 34.0 Ft.	20-40	FINE SILICA SAND
Top Bottom Ft.		
Top Bottom Ft.		

11. DRILLING LOG	Formation Description
Top Bottom	
0.0 / 9.0	RED SILTY CLAY
9.0 / 19.0	BROWN SILTY CLAY
19.0 / 34.0	TAN SILTY CLAY
/	
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12. REMARKS:
BENTONITE SEAL FROM 2.0 TO 3.0 FEET

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Brian Thomas 10/26/12
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

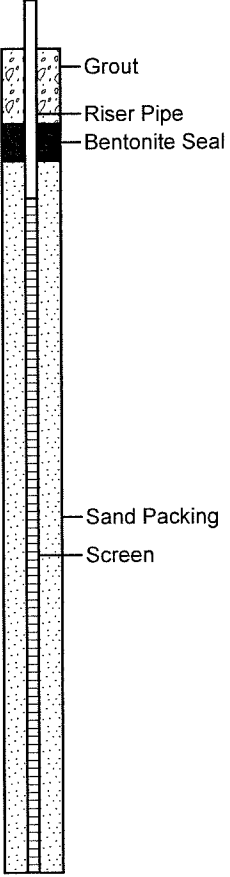
BRIAN THOMAS
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



LOG OF BORING GP-1

(Page 1 of 1)

Germantown Landfill Wilkes county, NC JOYCE Project No.356.1201.11 Task 01	Date Started	: 10/8/2012	Drilling Company	: Geologic Exploration
	Date Completed	: 10/8/2012	Northing Coord.	:
	Hole Diameter	: 4.25 inch	Westing Coord.	:
	Drilling Method	: Hollow Stem Augers	Survey By	:
	Sampling Method	:	Logged By	: Dan Girdner

Depth in Feet	Surf. Elev.	Blow Count	% Rec.	USCS	DESCRIPTION	Well: GP-1 TOC Elev.:	Well Construction Information
0					Brown to gray SILT		<p>WELL CONSTRUCTION</p> <p>Date Compl. : 10/8/12 Hole Diameter(s) : 4.25-inch Drilling Method(s) : HS Auger Company Rep. : Brian Thomas</p> <p>WELL CASING</p> <p>Material : Schedule 40 PVC Diameter : 1-inch Joints : Threaded, flush Approx. Csg. Stickup : 2.5-feet</p> <p>WELL SCREEN</p> <p>Material : Schedule 40 PVC Diameter : 1-inch Joints : Threaded, flush Opening : 0.010 inch</p> <p>GRAVEL PACK</p> <p>Type : # 2 Sand</p> <p>WELL SCREEN SEAL</p> <p>Type : 3/8" Bentonite Pellets</p> <p>ANNULUS SEAL</p> <p>Type : Grout</p> <p>PROTECTIVE CSG.</p> <p>Type : 4 inch OD, steel</p> <p>WELL PAD</p> <p>Type : 2 x 2 feet, 6 inch thick</p>
5				ML			
10					Tan SILT		
15				ML			
20							
25					Bottom of Boring		
30							
35							

JOYCEENGINEERING

LOG OF BORING GP-2

(Page 1 of 1)

Germantown Landfill
Wilkes county, NC

JOYCE Project No.356.1201.11 Task 01

Date Started : 10/8/2012

Date Completed : 10/8/2012

Hole Diameter : 4.25 inch

Drilling Method : Hand Auger

Sampling Method :

Drilling Company : Geologic Exploration

Northing Coord. :

Westing Coord. :

Survey By :

Logged By : Dan Girdner

Depth in Feet

Surf. Elev.

Blow Count

% Rec.

USCS

DESCRIPTION

0

5

10

15

20

25

30

35

Tan SILT

ML

Bottom of Boring

Well: GP-2

TOC Elev.:

Grout

Riser Pipe

Bentonite Seal

Sand Packing

Screen

Well Construction Information

WELL CONSTRUCTION

Date Compl. : 10/8/12

Hole Diameter(s) : 4.25-inch

Drilling Method(s) : HS Auger

Company Rep. : Brian Thomas

WELL CASING

Material : Schedule 40 PVC

Diameter : 1-inch

Joints : Threaded, flush

Approx. Csg. Stickup : 2.5-feet

WELL SCREEN

Material : Schedule 40 PVC

Diameter : 1-inch

Joints : Threaded, flush

Opening : 0.010 inch

GRAVEL PACK

Type : # 2 Sand

WELL SCREEN SEAL

Type : 3/8" Bentonite Pellets

ANNULUS SEAL

Type : Grout

PROTECTIVE CSG.

Type : 4 inch OD, steel

WELL PAD

Type : 2 x 2 feet, 6 inch thick

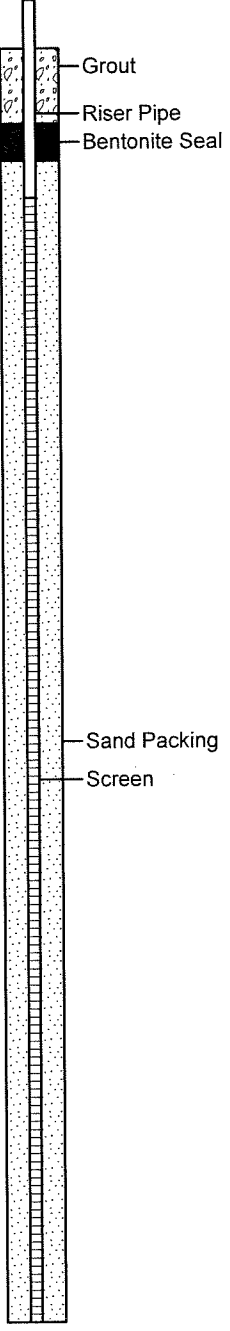
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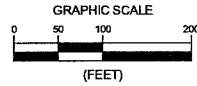
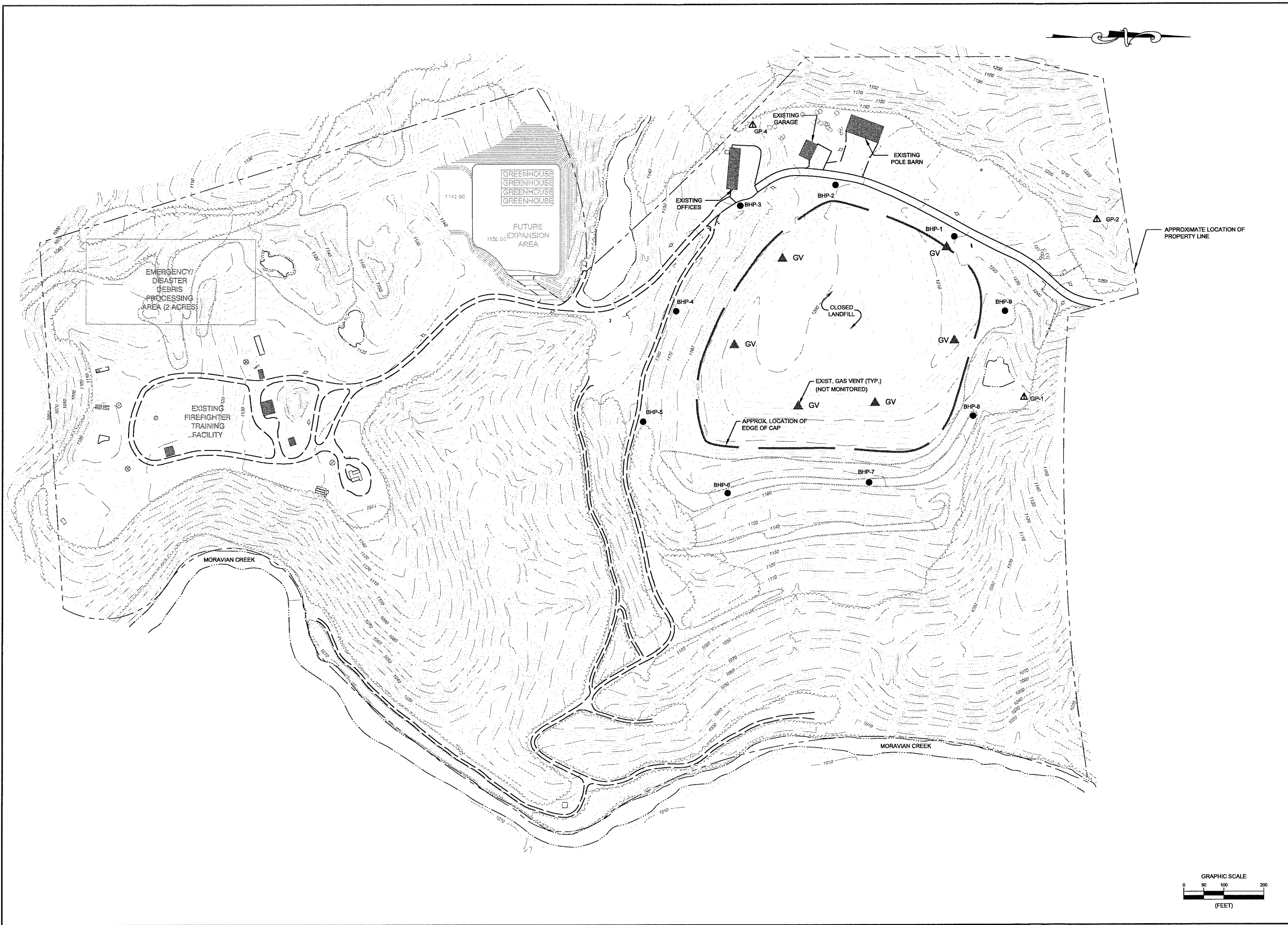


LOG OF BORING GP-4

(Page 1 of 1)

Germantown Landfill Wilkes county, NC JOYCE Project No.356.1201.11 Task 01	Date Started	: 10/8/2012	Drilling Company	: Geologic Exploration
	Date Completed	: 10/8/2012	Northing Coord.	:
	Hole Diameter	: 4.25 inch	Westing Coord.	:
	Drilling Method	: Hollow Stem Augers	Survey By	:
	Sampling Method	:	Logged By	: Dan Girdner

Depth in Feet	Surf. Elev.	Blow Count	% Rec.	USCS	DESCRIPTION	Well: GP-4 TOC Elev.:	Well Construction Information
0					Gray to Brown SILT		<p>WELL CONSTRUCTION</p> <p>Date Compl. : 10/8/12 Hole Diameter(s) : 4.25-inch Drilling Method(s) : HS Auger Company Rep. : Brian Thomas</p> <p>WELL CASING</p> <p>Material : Schedule 40 PVC Diameter : 1-inch Joints : Threaded, flush Approx. Csg. Stickup : 2.5-feet</p> <p>WELL SCREEN</p> <p>Material : Schedule 40 PVC Diameter : 1-inch Joints : Threaded, flush Opening : 0.010 inch</p> <p>GRAVEL PACK</p> <p>Type : # 2 Sand</p> <p>WELL SCREEN SEAL</p> <p>Type : 3/8" Bentonite Pellets</p> <p>ANNULUS SEAL</p> <p>Type : Grout</p> <p>PROTECTIVE CSG.</p> <p>Type : 4 inch OD, steel</p> <p>WELL PAD</p> <p>Type : 2 x 2 feet, 6 inch thick</p>
5				ML			
10					SAND, Poorly Graded, Brown SILT		
15				ML			
20					Brown SILT		
25							
30							
35					Bottom of Boring		



GERMANTOWN LANDFILL WILKES COUNTY, NORTH CAROLINA		 2211 W. MEADOWVIEW ROAD GREENSBORO, NC 27407 PHONE: (336) 332-0092 NC CORP LIC: C-0782	DESIGNED _____ HRW DRAWN _____ HRW CHECKED _____ ACE APPROVED _____ GVA DATE _____ 6/12/12																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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